

### **REMARKS**

The Office Action of July 13, 2009, has been carefully studied. Claims 1-3 currently appear in this application. These claims define novel and unobvious subject matter under Sections 102 and 103 of 35 U.S.C., and therefore should be allowed. Applicant respectfully requests favorable reconsideration and formal allowance of the claims.

### **Claim Amendments**

Claim 1 has been amended to provide antecedent basis for compounds in claim 2 by adding the term "carbocyclic or" between "condensed" and "heterocyclic" in the definition of Z<sup>1</sup> and Z<sup>2</sup>. Since these types of compounds are disclosed in claim 2, this is clearly not new matter.

Claim 1 has also been amended to define the molecular absorption coefficient ( $\epsilon$ ) by adding the phrase, "at the absorption maximum wavelength." Support for this amendment can be found in the specification as filed at the paragraph bridging pages 13 and 14.

### **Rejections under 35 U.S.C. 112**

Claim 2 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Examiner notes that claim 2 does not find antecedent basis in claim 1 because the groups that correspond to Z<sup>1</sup> and Z<sup>2</sup> are monocyclic or condensed carbocyclic aromatic rings, but in claim 1 Z<sup>1</sup> and Z<sup>2</sup> mean monocyclic or condensed heterocyclic aromatic rings.

This rejection is respectfully traversed.

Claim 1 has been amended to include condensed carbocyclic aromatic rings.

### **Art Rejections**

Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hohsaka et al., US 2001/0044074 and Namba et al., US 6,071,672 and Sun et al., *The Imaging Science Journal* **47(2)**:113-117, 1999. The Examiner alleges that one of ordinary skill in the art would have been motivated to make the claimed cyanine dyes of Formula 1 by substituting a monomethine cyanine dye disclosed by Namba or Sun for the trimethine cyanine dye of Hohsaka by substituting the perchlorate or bisphenyldithiol metal complex anion disclosed by Sun and Namba with the azo metal complex anion of Hohsaka with the expectation that additional cyanine dyes useful for optical recording material would be obtained.

This rejection is respectfully traversed.

The Examiner's reason for obviousness appears to rely on the assumption that cyanine dyes and their counter ions disclosed in various different publications can be freely combined or substituted with each other to obtain new cyanine dyes with a reasonable expectation of success. However, it is respectfully submitted that this is not the case.

For example, Namba defines and claims in claim 1 a photo-stabilized cyanine dye comprising a counter ion of formula (I) and a cyanine dye cation of formula (II). In Namba's cyanine dye, the combination of the counter ion of formula (I) and a cyanine dye cation of formula (II) is essential and indispensable. Thus, it can be said

that Namba **teaches away** from the combination of a counter ion of formula (I) and a cyanine dye cation other than that represented by Namba's formula (II), as well as the combination of a counter ion other than that represented by formula (I) and a cyanine dye cation of formula (II). Otherwise, Namba may lack enablement for the claimed compounds.

In fact, Namba states as follows:

With respect to the monomethine cyanine dyes and trimethine cyanine dyes belonging to the short-wavelength recording dyes which are expected to find future use, the invention succeeded in significantly improving their light resistance over prior art photo stabilized dyes having a quencher ion as the counter ion.  
**Cyanine dyes having  $\text{ClO}_4^-$ ,  $\text{BF}_4^-$  or  $\text{I}^-$  as the counter ion are well soluble in TFP, but practically unacceptable because they readily fade and deteriorate by light irradiation** [column 40, line 64 to column 41, line 1, emphasis added]

In addition, Namba notes that other dyes can be included in an optical recording medium. These other dyes may have different counter ions from the claimed dyes. It is clear that Namba is specific with respect to the particular counter ions that are acceptable with the monomethine cyanine dyes disclosed and claimed therein.

That is, Namba teaches a photostabilized cyanine dye having a counter ion of formula (I) and a cyanine dye cation of formula (II), and does not teach any other combination of a counter ion and a cyanine dye cation other than those of formulae (I) and (II).

The same reasoning applies to the rejection based upon Hohsaka.

Hohsaka discloses a trimethine cyanine dye comprising a trimethine cyanine cation of Formula 1 and a counter ion of  $\text{X}^-$  such as an azo metal complex anion. According to Hohsaka, it is essential that the trimethine cyanine dye cation of Formula 1 be combined with the disclosed anions, depending upon the uses for the dye (paragraphs

[0020]-[0021])). That is, one would choose a counter ion based upon the uses to which the dye is to be put. The counter ions are not interchangeable because changing the counter ion would produce a dye with different characteristics. Thus, there is no motivation to substitute the counter ion of Namba or Sun in the Hohsaka dyes.

It is also respectfully submitted that one skilled in the art would not have been motivated to replace the trimethine cyanine dye cation of Hohsaka by the monomethine cyanine dye cation disclosed in Namba with a reasonable expectation of success in producing a new and useful cyanine dye. Replacing the trimethine cyanine dye cation of Hohsaka by the monomethine cyanine dye cation disclosed in Namba goes beyond any teaching or suggestion in either Hohsaka or Namba.

It is also respectfully submitted that one skilled in the art would not have been motivated to replace the counter ion of formula (I) of Namba by the azo metal complex anion disclosed in Hohsaka with reasonable expectation of success in producing a new and useful cyanine dye because the counter ion of formula (I) is essential to the compound of Namba. Neither Namba nor Hohsaka teaches or suggests anything about the totally new combination of an azo metal complex anion disclosed in Hohsaka and the monomethine cyanine dye cation disclosed in Namba. Since both Namba and Hohsaka disclose that the particular cation is specific to the dyes disclosed, one would not expect that making a substitution of a counter ion would be expected to produce a useful dye.

It is also respectfully submitted that one skilled in the art would not have been motivated to replace the perchlorate anion of Sun by the azo metal complex anion of Hohsaka with a reasonable expectation of success in producing a new and useful cyanine dye. The perchlorate anion is essential and indispensable to the cyanine dye of

Sun, and neither Sun nor Hohsaka has any teaching or suggestion about this totally new combination of the azo metal complex disclosed in Hohsaka and the monomethine cyanine dye cation disclosed in Sun.

In particular, as shown in Table 1 at page 21 of Hohsaka, the properties of a cyanine dye, such as solubility and decomposition point, vary widely depending on the type of anion. For this reason it is believed that one skilled in the art would not have been motivated to replace the counter ion of formula (I) of Hohsaka, or the perchlorate anion of Sun, by the azo metal complex anion disclosed in Hohsaka with a reasonable expectation of success.

As further demonstration of the unobviousness of the dyes claimed herein, it should be noted that the claimed cyanine dye possesses unexpected excellent properties. As shown in Example 1 at pages 19-21 of the instant specification, a cyanine dye of Chemical Formula 1, comprising a monomethine cyanine dye cation and **an azo metal complex** had a decomposition point of about 245°C. However, a cyanine dye of Chemical Formula 14, comprising a monomethine cyanine dye cation and **ClO<sub>4</sub><sup>-</sup>** anion had a decomposition point of about 210°C, which is considerably lower than that of Chemical Formula 1.

Additionally, as shown in Example 2 at pages 21-23 of the present specification, a cyanine dye of Chemical Formula 9, comprising a monomethine cyanine dye cation and an **azo metal complex** had a decomposition point of about 305°C, whereas a cyanine compound of chemical Formula 16, comprising a monomethine cyanine dye cation and **ClO<sub>4</sub><sup>-</sup>** had a decomposition point of only 270°C, which is much lower than the decomposition point of the compound of Chemical Formula 9.

There is nothing in any of Namba, Hohsaka or Sun that would lead one skilled in the art to expect that substitution of one anion for another would make such a difference in the decomposition points of the compounds.

As such, it is respectfully submitted that one skilled in the art would not have been motivated to replace the trimethine cyanine dye cation of Hohsaka by the monomethine cyanine dye cation disclosed in Namba with a reasonable expectation of success in producing a new and useful cyanine dye.

In view of the above, it is respectfully submitted that the claims are now in condition for allowance, and favorable action thereon is earnestly solicited.

Respectfully submitted,

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